



TECHNISCHE UNIVERSITÄT
CHEMNITZ

Fakultät für Informatik
Professur Technische Informatik

Automotive Software Engineering

Lecture 1 - Introduction

**Prof. Dr. Wolfram Hardt
Dipl.-Inf. Englisch Norbert
M. Sc. Hänchen Felix
M. Sc. Khan Owes**

4th April 2017

ASE Practical overview

- 4 Tracks:
 - Tuesday from 07:30 to 10:30 AM
 - Group 1:** each alternate week, starting from **11th April 2017**
 - Group 3:** each alternate week, starting at **18th April 2017**
 - Wednesday from 07:30 to 10:30 AM
 - Group 2:** each 2nd week, starting from **12th April 2017**
 - Group 4:** each 2nd week, starting from **19th April 2017**
 - **Be punctual!**
 - **Prepare units at home**
 - **Explain your solution**
- **Register in OPAL → link on website of professorship (04th April 2017)**
<http://www.tu-chemnitz.de/informatik/ce/lectures/lectures.php>

Lecture ASE

- The lecture prepares you for the units, it gives you the most important facts about the next practical unit
- Each second week, starting at 04th October 2017,
Room: 1/305
Time: 17:15 AM – 18:45 PM
- Topics of Lecture:
Communication, Bus Systems, AUTOSAR, Test of ECUs

ASE Practical overview

	Group 1	Group 2	Group 3	Group 4
Unit 1	11.04.2017	18.04.2017	12.04.2017	19.04.2017
Unit 2	02.05.2017	09.05.2017	03.05.2017	10.05.2017
Unit 3	16.05.2017	23.05.2017	17.05.2017	24.05.2017
Unit 4	30.05.2017	06.06.2017	31.05.2017	07.06.2017
Unit 5	13.06.2017	20.06.2017	14.06.2017	21.06.2017
<i>Unit 6 (optional)</i>	(???)	(???)	(???)	(???)
Repeating Unit	27.06.2017/28.06.2017			

Register for one group!

ASE Practical – overview of units

- Each unit starts with a short written test
Be punctual! The test is written at the beginning of each unit – if you are not present, you will fail.
- 5 (+1) Units – each Unit 5 Points = Overall 25 Points

Short Test	2 or 3 Points
Practical	3 or 2 Points
- → >0 points in Test **AND** in Practical are needed to pass a Unit
- You can repeat **exactly** one unit one time (if a Unit is not passed)
- Repeating unit is at the end of the semester (shortly before exams)

ASE Practical – schedule of each unit

TEST	PRACTICAL	PRESENTATION	RESULT
Written Test of each student	Practical itself, executing code prepared at home, little help by supervisors possible	Presentation of ALL Tasks to supervisor	Result of written test AND practical
5 to 15 minutes	round about 160 minutes, depending on other slots	5 minutes !!!	2 minutes

- Prepare Units at home (algorithms, code) → compile and debug in practical
- Show and explain your results – Explain the important facts/features
- If you did not present your tasks until the end of the unit, your practical unit is defined as failed (0 points)
- Consider lunch break for Friday groups

ASE Practical – exam

- „Studienordnung 2010“:
 - Do all 5 units → you will get 2 credits
 - No exam
- „Studienordnung 2013/2016“:
 - Do all 5 units → if you pass them, you can register for the exam
 - Practical units + exam → you will get 5 credits
 - Exam handles topics of the units – 90 minutes written exam

ASE Practical – topics of units

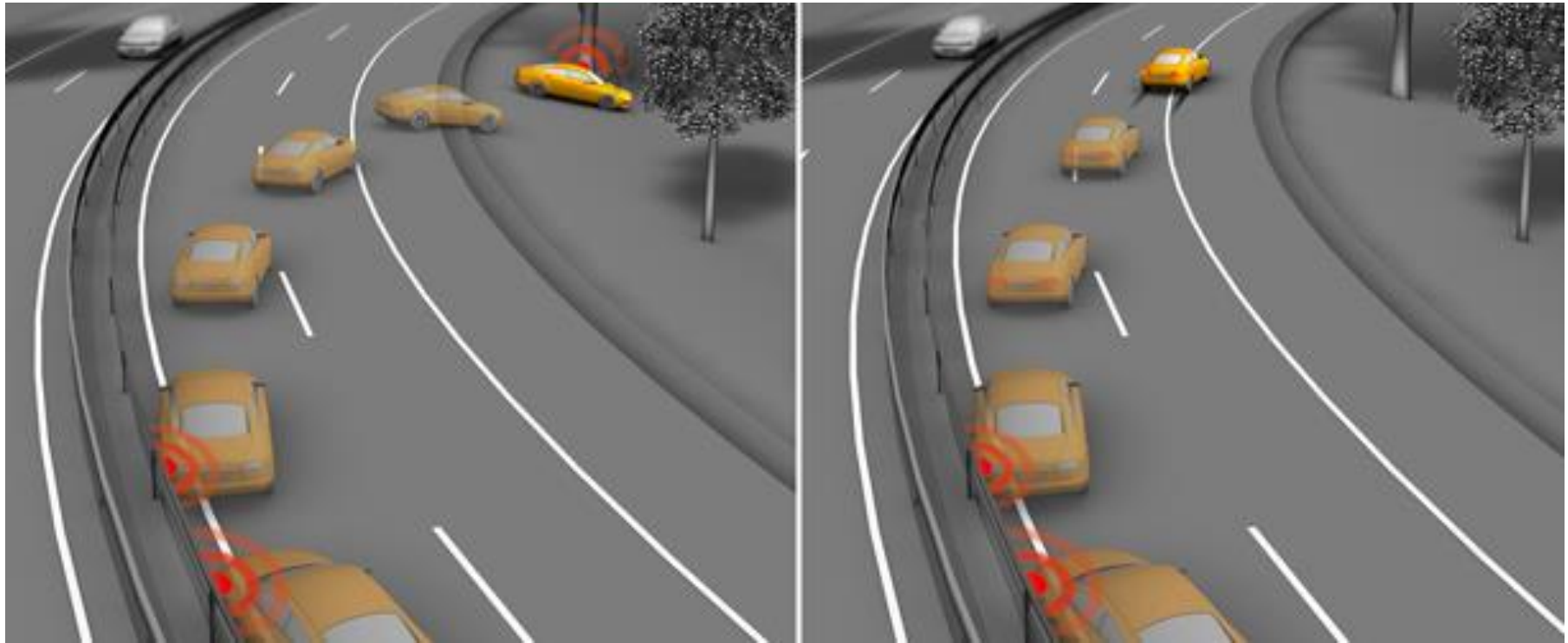
- | | |
|--|---------------------|
| 1 Unit (Introduction):
To get to know the Board | <i>(3+2 Points)</i> |
| 2. Unit (CAN1):
Easy CAN, Connection ECU/PC, R/W CAN | <i>(2+3 Points)</i> |
| 3. Unit (CAN2):
Teamwork, Bus-System CAN | <i>(2+3 Points)</i> |
| 4. Unit (AUTOSAR):
AUTOSAR Application | <i>(2+3 Points)</i> |
| 5. Unit (Test):
Black Box Test ECU, manual an automatic | <i>(2+3 Points)</i> |
| 6. Unit (Simulink):
<i>Changes in Yellow Car Application</i> | <i>(3+2 Points)</i> |

Example ASE: Pre-Crash-System



Source: <http://www.auto-motor-und-sport.de/bilder/pre-safe-und-pre-cash-system-schutz-bereits-vor-dem-crash-1205775.html>

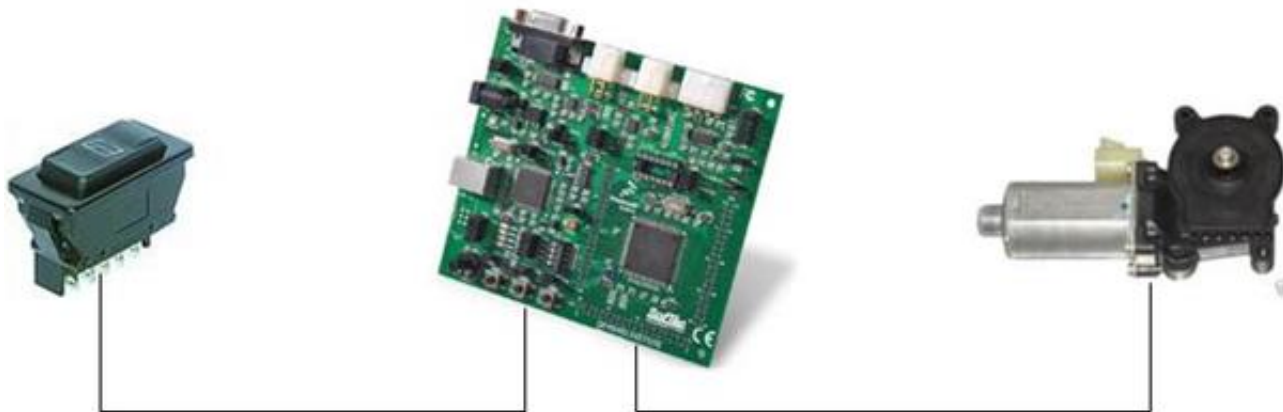
Example ASE: Post-Crash-System



Source: <http://www.atzonline.de/Aktuell/Nachrichten/1/16280/Neues-Post-Crash-Bremssystem-von-Continental-verhindert-Folgeunfaelle.html>

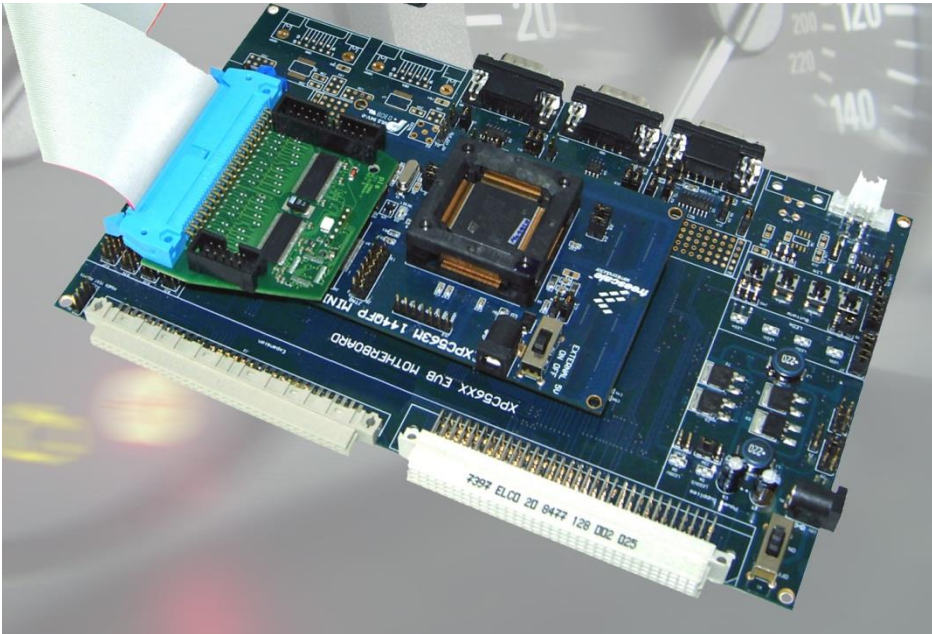
ECU overview

- ECU = Electronic Control Unit
- ECU integrates functionalities for calculation, analysis of sensor data and controlling actuators
- A premium car has up to 80 ECUs – connected to different bus systems (like CAN Bus)

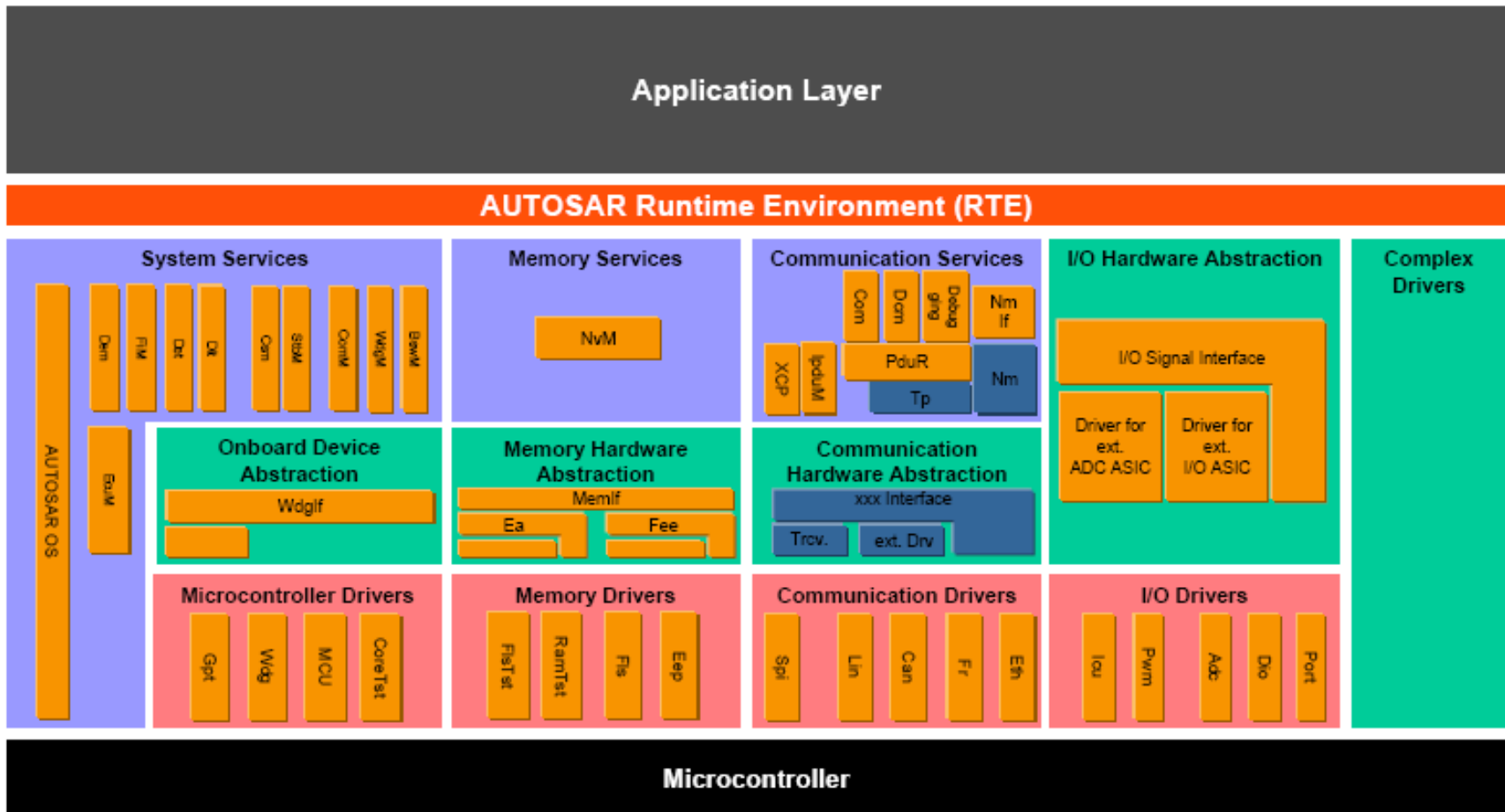


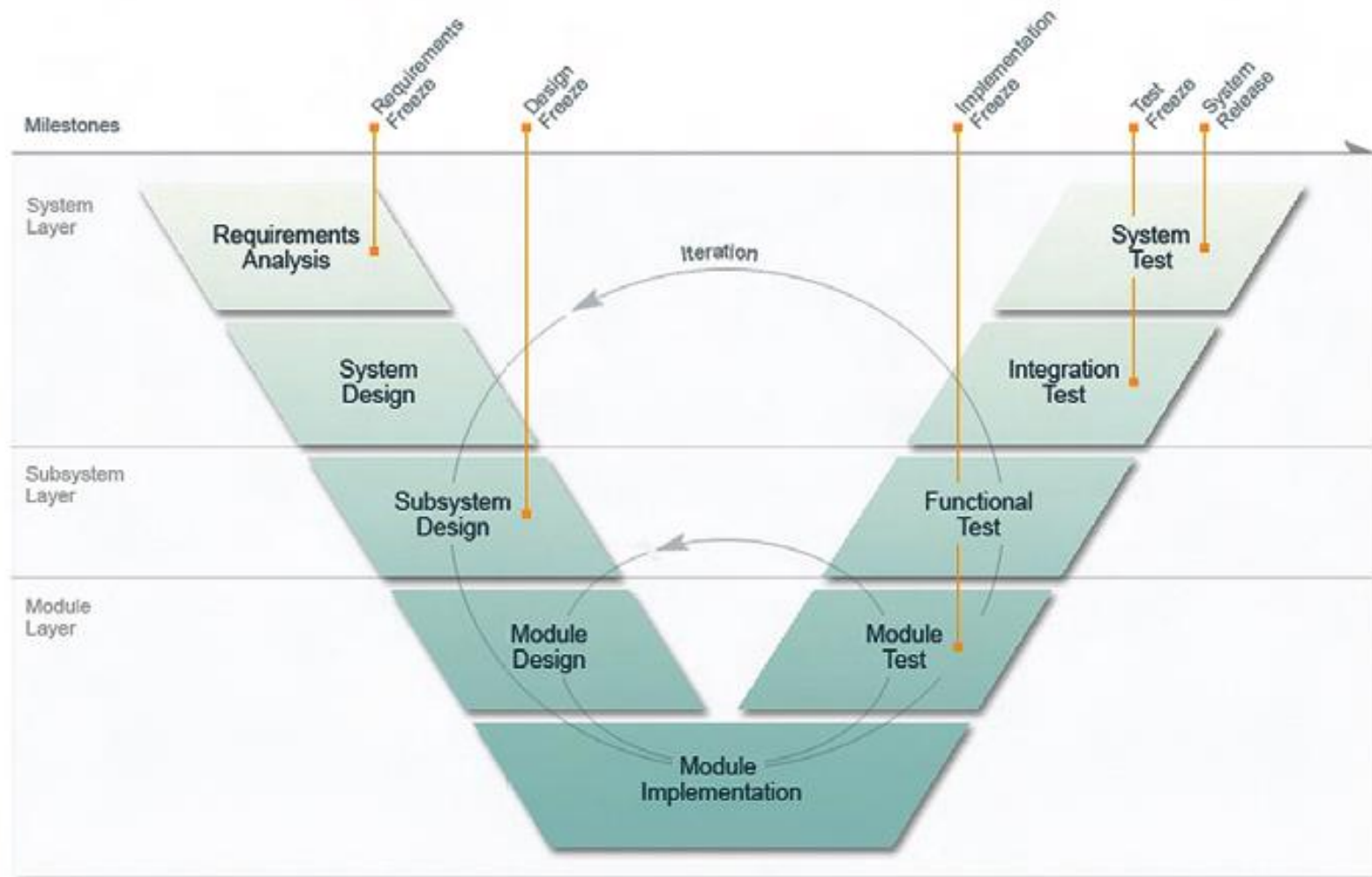
ECU used in practical

STM SPC560 (AUTOSAR 3.1) → used in Yellow Car demonstrator



AUTOSAR Overview







Thanks for your attention!

Good luck with your Master Course!

